

## **Support for Claim Amendments**

Claims 1 – 16 are pending in the application. Claims 1, 2, 5, 6 8, 9, 10, 11, 12, 14, 15 and 16 have been amended. New claims 17, 18, 19 and 20 have been added. No new matter has been added.

Claim 1 has been amended to include atomization nozzles. Support for the amendments can be found at least at claim 9; page 7, lines 8 – 16; FIG. 3; page 10, line 14, and page 13, lines 12 – 16 of WO 2005/078051. Claim 1 has also been amended to conform to proper US practice by including proper antecedent basis.

Claims 2 has been amended to include proper antecedent basis and a proper alternative Markush group.

Claim 5 has been amended to include proper antecedent basis.

Claim 6 has been amended for proper US practice, with new dependent claim 17 being added from elements deleted from claim 6.

Claim 8 has been amended to include proper antecedent basis.

Claim 9 has been amended to include proper antecedent basis.

Claim 10 has been amended to include atomization nozzles and proper antecedent basis. Support for the amendments can be found at least at claim 9; page 7, lines 8 – 16; FIG. 3; page 10, line 14, and page 13, lines 12 – 16 of WO 2005/078051.

Claim 11 has been amended to include proper antecedent basis.

Claim 12 has been amended to include proper antecedent basis.

Claim 14 has been amended for proper US practice, with new dependent claim 18 being added from deleted elements of original claim 14.

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Claim 15 has been amended for proper US practice, with new dependent claim 19 being added from deleted elements of original claim 15.

Claim 16 has been amended for proper US practice, with new dependent claim 20 being added from deleted elements of original claim 16.

This amendment and response presents no new issues and we therefore request entry of the amendments into the file.

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**REMARKS**

Claims 1 – 20 are rejected under 35 U.S.C. 103(a) as being obvious over Ellingsen (US 6,660,158). The rejection is traversed for at least the following reasons.

Independent claims 1 and 10, relating to a cracking process and a cracking unit, respectively, have been amended to include atomization nozzles. Ellingsen does not disclose atomization nozzles. The atomization nozzles produce a flow pattern in the riser of the present invention to ensure that the equilibrium temperature between the oil feed and the regeneration catalyst are reached in the shortest possible time. This is done in order to assure the rapid and homogeneous vaporization of the feed which is achieved with an atomized feed injection system (*see page 7, lines 8 – 16 of WO 2005/078051*). Additionally, the atomization nozzles allow for the feed components to be subjected to the same cracking severity.

Furthermore, the present claimed invention differs from Ellingsen in that Ellingsen is a process for heavy oil comprising a reactor with a rotating fluidized bed catalyst and whereby the compressed gases and/or steam is injected into the bed in order to effect movement of the catalyst bed (FIG 4). One difference between Ellingsen and the presently claimed invention is that in the present invention the cracking takes place in the riser of varying cross section (FIG. 1, F) which is attached to a cyclone (FIG. 1, N). In Ellingsen the riser (FIG. 1, o) is simply used to pneumatically suck off the regenerated catalyst from the regenerator (column 6, 57 – 59 of Ellingsen). Velocities in the riser of the present invention are achieved through different diameters of the riser. For example, the diameter can be increased 100% above the injection port of the feed and reduced before the entrance to the cyclone N (*See page 6, paragraph [0091] and FIG. 1*). Ellingsen does not teach or suggest a riser with varying cross section.

Claim 1 of the present application recites that the fine grained minerals are put in motion from the regenerator operated at a temperature of 450°C to 600°C through two exit lines with outlet under the level of the fluidized bed. The fine grained minerals are desirable for a given feed and catalyst system. The choice of the temperature range of 450°C to 600°C is not taught or

suggested by Ellingsen and would therefore not be obvious to one of skill in the art from the disclosure of Ellingsen.

To make a *prima facie* case of obviousness, all the limitations of the claims must be taught or suggested in the references cited by the Examiner and all the teachings of the prior art need to suggest the claimed subject matter to the person of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 (Fed. Cir. 2000). As articulated by the Supreme Court in a recent case, a combination is obvious if it is no more than the predictable use of known elements according to their established functions; and there is a reason to combine the known elements. *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007). “[I]t remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed.” *Id.* Ellingsen does not teach or suggest atomization nozzles in the riser with varying diameter. Applicants submit that the Examiner has failed to make the required *prima facie* case, as the cited reference, does not teach or suggest all the claim limitations, such as the atomization nozzles, and lacks sufficient reason to combine.

Because claims 2 – 9 and 11 – 16 depend either directly or indirectly from independent claims 1 and 10, claims 2 – 9 and 11 – 16 are also not obvious over Ellingsen.

Therefore, claims 1 – 16 of the present invention are not obvious over Ellingsen. Withdrawal and reconsideration of the rejections under 35 U.S.C. 103(a) is requested. Applicants do not otherwise concede the correctness of the rejections and reserve the right to make additional arguments as may be necessary.

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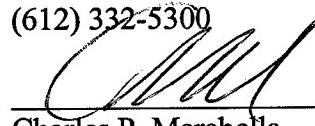
## **Conclusion**

In view of the above amendments and remarks, a Notice of Allowance is requested. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

Please charge any additional fees or credit any overpayment to Merchant & Gould P.C., Deposit Account No. 13-2725.

Respectfully submitted,

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